IN THE CLAIMS:

Listing of Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1.   (currently amended) A method for processing ~~an in-process substrate~~a specimen using a plasma, comprising the steps of:

generating a plasma in a processing chamber in which the ~~in-process substrate~~ specimen is disposed; and

processing the ~~in-process substrate~~ specimen with ~~a~~ the plasma generated in the processing chamber, wherein

the ~~plasma~~ step of processing ~~step of the in-process substrate~~ the specimen further comprises:

an irradiation step ~~of~~ for projecting and scanning a light beam into the processing chamber through an observation window of the processing chamber;

a detection step ~~of~~ for detecting ~~reflected~~ a light of the projected light beam which is reflected from ~~the~~ an inside wall of the processing chamber, the light being detected by separating a light component from light emanated from the plasma and light reflected from the inside wall by use of a spectroscope; and

a signal processing step ~~of~~ for obtaining information on ~~the~~ a state of contamination of the inside wall of the processing chamber, by processing a signal obtained ~~through detection of the reflected light~~ at the detection step.

2.   (currently amended) A method for processing ~~an in-process substrate~~ a specimen using a plasma according to Claim 1, further comprising

a control step ~~of~~ for controlling the plasma processing ~~for~~ of the ~~in-process substrate~~ specimen, based on the information on the state of contamination of the inside wall obtained at the signal processing step.

3.   (currently amended) A method for processing ~~an in-process substrate~~ a specimen using a plasma according to Claim 1, wherein at the detection step, a ~~speckle pattern~~ specular reflection component of the reflected light from the inside wall of the processing chamber is ~~imaged~~ formed by an imaging optical system, and ~~received at~~ detected by a detector ~~before detection~~.

4.   (currently amended) A method for processing ~~an in-process substrate~~ a specimen using a plasma according to Claim 3, wherein at the detection step, when the specular reflection component of the reflected light is ~~imaged~~ formed by an imaging optical system through the observation window and ~~received~~ detected by a detector, a light generated from the plasma in the processing chamber is cut off by a filter.

5.   (currently amended) A method for processing ~~an in-process substrate~~ a specimen using a plasma according to Claim 1, wherein at the irradiation step, when the beam is projected into the inside of the processing chamber~~, the light generated~~ is and scanned so as to be projected onto a plurality of locations on the inside wall of the processing chamber.

6.   (currently amended) A method for processing ~~an in-process substrate~~ a specimen using a plasma according to Claim 1, wherein projecting the light beam into the inside of the processing chamber at the irradiation step and detecting the reflected light ~~image~~ at the detection step are conducted through the same observation window.

7.   (currently amended) A method for processing ~~an in-process substrate~~ a specimen using a plasma according to Claim 1, wherein at the detection step, the reflected light from the inside wall of the processing chamber varies in accordance with a variation in the state of irregularity of the inside wall of the processing chamber.

8.   (currently amended) A method for processing ~~an in-process substrate~~ a specimen using a plasma according to Claim 1, wherein at the irradiation step, ~~a~~ intensity of the light beam ~~intensity-modulated~~ is modulated by a desired frequency and the light beam is projected into the inside of the processing chamber through the observation window.

9.   (currently amended) A method for processing ~~an in-process substrate~~ a specimen using a plasma according to Claim 8, wherein at the signal processing step, information on the state of contamination of the inside wall of the processing chamber is obtained by extracting a light component which has a frequency which is the same as the ~~intensity-modulated~~ desired frequency ~~component from the received light signal detected at the detection step~~ utilized for modulation.

10.   (currently amended) A method for processing ~~an in-process substrate~~ a specimen using a plasma according to Claim 1, wherein at the detection step, a light image limited by a diaphragm placed at an imaging position of the imaging optical system is received by a detector.

11.   (currently amended) A method for processing ~~an in-process substrate~~ a specimen using a plasma according to Claim 1, wherein at the irradiation step, the light beam to be projected into the inside of the processing chamber has a desired

wavelength component, and at the detection step, the desired wavelength component is separated from the reflected light image before detection.

12.   (currently amended) A method for processing an in-process substrate a specimen using a plasma, comprising the steps of:

generating a plasma in a processing chamber in which an in-process substrate a specimen is disposed;

processing the in-process substrate specimen with a the plasma generated in the processing chamber;

wherein the plasma step of processing step of the in-process substrate specimen further -comprises:

projecting a light beam into the inside of the processing chamber through an observation window;

branching splitting light reflected light from the inside of the processing chamber resulting from the irradiation in response to the projected light beam and passed through the observation window;

obtaining information on suspended foreign materials material in the processing chamber by detecting one of the branched portions of the reflected split light; and

obtaining information on the a state of contamination of the an inside wall of the processing chamber by detecting the other of the branched portions of the reflected split light.

13.   (currently amended) A method for processing an in-process substrate a specimen using a plasma according to Claim 12, further comprising a step of controlling the plasma processing for of the in-process substrate specimen, based on information on the suspended foreign material in the processing chamber and

information on the state of contamination of the inside wall of the processing chamber.

14. (currently amended) A method for processing ~~an in-process substrate~~ a specimen using a plasma according to Claim 12, wherein at the step of projecting the light beam, ~~a~~ intensity of the light beam ~~intensity~~ is modulated by a desired frequency and the light beam is projected into the inside of the processing chamber.

15. (currently amended) A method for processing ~~an in-process substrate~~ a specimen using a plasma according to Claim 14, wherein at the step of obtaining the information on the suspended foreign ~~materials~~ material, information on the suspended foreign material in the processing chamber is obtained by extracting a light component ~~of a~~ which has a frequency which is the same as the desired ~~intensity-modulated~~ utilized for modulation frequency from the ~~signal obtained by detecting~~ one of the ~~branched portion of the reflected~~ split light.

16. (currently amended) A method for processing ~~an in-process substrate~~ a specimen using a plasma according to Claim 14, wherein at the step of obtaining the information on the state of contamination of the inside wall of the processing chamber, information on the state of contamination of the inside wall of the processing chamber is obtained by extracting a component of a desired ~~intensity-modulated~~ frequency from ~~the signal obtained by detecting~~ the other ~~branched portion of the reflected~~ of the split light.

17. (currently amended) A method for processing ~~an in-process substrate~~ a specimen using a plasma according to Claim 12, wherein both of the light beam to be projected into the inside of the processing chamber at the ~~irradiation~~ projection

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step and the reflected light from the inside of the processing chamber at the step of branching splitting the reflected light pass through the same observation window

18.   (currently amended) A method for processing ~~an in-process substrate~~ a specimen using a plasma according to Claim 12, wherein at the step of obtaining the information on the state of contamination of the inside wall of the processing chamber by detecting the other ~~branched portion of the reflected~~ of the split light, ~~the~~ a scattered reflected light component from the inside wall of the processing chamber, ~~among the other branched portion of the reflected light,~~ is cut off by a spatial filter ~~before detection~~.

19.   (withdrawn) An apparatus for processing an in-process substrate by generating a plasma, comprising:

a processing chamber with an observation window, in which the in-process substrate is disposed;

plasma generating means for generating a plasma in the inside of the processing chamber;

irradiation means for projecting a light beam into the inside of the processing chamber through the observation window;

detection means for detecting the light that has been projected by the irradiation means and reflected by the inside wall of the processing chamber; and

processing means for obtaining information on the state of contamination of the inside wall of the processing chamber by processing a signal obtained through detection of the reflected light by the detection means.

20.   (withdrawn) A plasma processing apparatus according to Claim 19, further comprising control means for controlling the plasma processing of the in-

process substrate, based on information on the state of contamination of the inside wall of the processing chamber that has been obtained by the processing means.

21. (withdrawn) A plasma processing apparatus according to Claim 19, wherein the irradiation means projects the light beam into the inside of the processing chamber in a scanning manner.

22. (withdrawn) A plasma processing apparatus according to Claim 19, wherein the irradiation means projects a light beam intensity-modulated with a desired frequency into the inside of the processing chamber.

23. (withdrawn) A plasma processing apparatus according to Claim 22, wherein the processing means obtains the information on the sate of contamination of the inside wall of the processing chamber by extracting the intensity modulated frequency component from signals obtained through detection of the reflected light by the detection means.

24. (withdrawn) A plasma processing apparatus according to Claim 19, wherein the detection means is equipped with an imaging optical system and detects an optical image of the reflected light from the inside wall of the processing chamber.

25. (withdrawn) A plasma processing apparatus according to Claim 24, wherein the detection means detects a speckle pattern image.

26. (withdrawn) A plasma processing apparatus according to Claim 24, the detection means detects an light image that is restricted by a diaphragm being set at an imaging position of the imaging optical system.

27. (withdrawn) A plasma processing apparatus according to Claim 19, wherein the detection means detects the reflected light through the observation window, through which the irradiation means made the light beam pass.

28. (withdrawn) A plasma processing apparatus according to Claim 19, wherein the irradiation means and the detection means share a wave plate, by which the irradiation means changes a polarization state of the light beam to be projected into the inside of the processing chamber by the irradiation means and also by which the detection means changes a polarization state of the reflected light from the inside of the processing chamber.

29. (withdrawn) An apparatus for processing an in-process substrate by generating a plasma, comprising:

a processing chamber with an observation window, in which an in-process substrate is disposed;

plasma generating means for generating a plasma in the inside of the processing chamber;

irradiation means for projecting a light beam into the inside of the processing chamber through the observation window;

branching means for branching reflected light from the inside of the processing chamber resulting from the light projected by the irradiation means and passed through the observation window;

foreign-material detecting means for obtaining information on suspended foreign materials in the processing chamber by detecting one of portions into which the reflected light has been branched by the branching means; and

state-of-contamination detecting means for obtaining information on the state of contamination of the inside wall of the processing chamber by detecting the other of portions into which the reflected light has been branched by the branching means.

30.   (withdrawn) A plasma processing apparatus according to Claim 29, further comprising, control means for controlling plasma processing for the in-process substrate, based on both of information on the suspended foreign materials in the processing chamber that has been detected by the foreign-material detecting means and information on the state of contamination of the inside wall of the processing chamber that has been detected by the state-of-contamination detecting means.

31.   (withdrawn) A plasma processing apparatus according to Claim 29, wherein the irradiation means projects light beam intensity-modulated by a desired frequency into the inside of the processing chamber.

32.   (withdrawn) A plasma processing apparatus according to Claim 31, wherein the foreign-material detecting means obtains information on the suspended foreign materials in the processing chamber by extracting a component of a desired intensity-modulated frequency from signals obtained by detecting one of portions into which the reflected light has been branched by the branching means.

33.   (withdrawn) A plasma processing apparatus according to Claim 31, wherein the state-of-contamination detecting means obtains information on the state of contamination of the inside wall of the processing chamber by extracting a component of a desired intensity-modulated frequency from signals obtained by

detecting the other of portions into which the reflected light has been branched by the branching means.

34.   (withdrawn) A plasma processing apparatus according to Claim 29, wherein at irradiation means, both the light beam projected into the inside of the processing chamber and the reflected light from the inside of the processing chamber that has been branched by the branching means, are pass through the same observation window of the processing chamber.

35.   (withdrawn) A plasma processing apparatus according to Claim 29, wherein the state-of-contamination detecting means is equipped with a spatial filter that cuts off a scattered reflected light component from the inside wall of the processing chamber, among the other of portions into which the reflected light has been branched by the branching means.